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The genus *Hybos* Meigen (Diptera: Empidoidea: Hybotidae) in Thailand

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Abstract

The genus *Hybos* Meigen in Thailand is revised and full descriptions and keys provided for all 41 species. Thirty-four new species are recognized: *H. aceriformis* sp. nov., *H. ancylochiles* sp. nov., *H. anisoserratus* sp. nov., *H. bispinatus* sp. nov., *H. chaweewani* sp. nov., *H. daugeroni* sp. nov., *H. divisus* sp. nov., *H. grootaerti* sp. nov., *H. hylobates* sp. nov., *H. inthanonensis* sp. nov., *H. kaluang* sp. nov., *H. khamfui* sp. nov., *H. konkaogwang* sp. nov., *H. lannaensis* sp. nov., *H. mangraii* sp. nov., *H. meeannat* sp. nov., *H. men* sp. nov., *H. merzi* sp. nov., *H. ngachang* sp. nov., *H. paknok* sp. nov., *H. phahompokensis* sp. nov., *H. pisadaanus* sp. nov., *H. saenmueangmai* sp. nov., *H. shamshevi* sp. nov., *H. sinclairi* sp. nov., *H. songbai* sp. nov., *H. steatopygus* sp. nov., *H. stigmaticus* sp. nov., *H. subapicalis* sp. nov., *H. tetricus* sp. nov., *H. thaosaao* sp. nov., *H. thepkaisoni* sp. nov., *H. tilokarati* sp. nov., *H. yungyak* sp. nov. Seven species known previously from China are recognized: *H. ancistroides* Yang & Yang, *H. apicichamatus* Yang & Yang, *H. longus* Yang & Yang, *H. particularis* Yang, Yang & Hu, *H. serratus* Yang & Yang, *H. xishuangbannaensis* Yang & Yang, and *H. zhejiangensis* Yang & Yang. Eight informal species-groups are tentatively proposed based on characters of male and female terminalia and attention is drawn to the many previously overlooked taxonomically useful characters of the female terminalia. Distribution maps of all species are presented and distributions categorised as ‘widespread’, ‘eastern’, ‘southern’, north-eastern’ or ‘northern and western’. Species richness and endemism are greatest in mid to high elevation evergreen forest biotopes of the northern mountains and areas of endemism are identified on the Luang Prabang, Daen Lao, Thanon Thongchai ranges and on the Isaan Plateau at least. Adult phenology is correlated with the rainy season in many species and preliminary analyses reveal that many high-elevation species have short emergence periods and restricted distributions, whereas some lowland species have longer emergence periods and wider distributions.

Key words: new species, distribution, endemic, phenology, taxonomy, diversity

Introduction

Hybos Meigen (Diptera: Hybotidae: Hybotinae) is a genus of small to medium sized, usually dark coloured predatory flies with characteristically swollen and spinose hind femora (Figs 1–3). The genus is widely distributed but approximately 70% of the 164 species catalogued by Yang *et al.* (2007) are restricted to Asia, predominantly in the eastern Oriental Realm. Despite earlier work by, for example Brunetti (1913, 1920), de Meijere (1914), Frey (1938, 1953), Saigusa (1963, 1965) and Smith (1965), the Asian *Hybos* fauna remains little known although recent studies in Vietnam (Huo *et al.* 2010) and more especially in China (Shi *et al.* 2009; Yang & Grootaert 2005, 2006; Yang & Merz 2004; Yang & Li 2011; Yang *et al.* 2005, 2006; Yang *et al.* 2010) have resulted in many east Asian species being described.

Although *Hybos* has been reported from Thailand (Papp *et al.* 2006) where it is widespread, often abundant, and may be an important component of several forest communities of Empidoidea (Plant *et al.* 2011), the species occurring there remain completely unknown. The present work utilizes a wealth of material obtained from recent intensive collecting efforts in Thailand. New species are described and species known previously from elsewhere and now discovered in Thailand are redescribed in order to provide a comprehensive and consistent account of all the species occurring there. Aspects of the distribution, endemism, phenology and ecology are briefly discussed.

Materials and methods

Approximately 2,500 specimens of *Hybos* spp. mostly collected during recent mass-sampling programs in Thailand (for details see Plant *et al.* 2011) supplemented with 43 specimens from MNMG and 19 from ZMMU were used in this study. Of these, 2,146 specimens were in good state of preservation and were used to delimit the species. The remainder being damaged, teneral, bleached or with putative taxa represented only by singleton females were not studied further. Male terminalia were macerated in hot (~95°C) lactic acid. Characters of the female terminalia were generally easily visible in unmacerated wet-preserved material, but were often not apparent in dry-preserved material which was therefore softened using lactic acid to reveal important characters.

Terminology. Morphological terms are essentially those of McAlpine (1981) and Stuckenberg (1999). Interpretation of genitalic homology follows Cumming *et al.* (1995) and Sinclair (2000).

In *Hybos*, the male terminalia are rotated ~90° to the right; thus for example, the left epandrial lamella, actually appears in an approximately dorsal position. In the species accounts, descriptions of morphological characters as